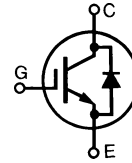


Low $V_{CE(sat)}$ IGBT with Diode
High Speed IGBT with Diode

IXGH/IXGT 15N120BD1
IXGH/IXGT 15N120CD1

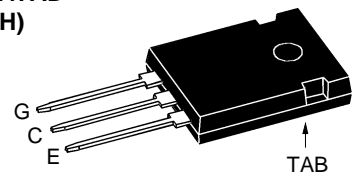
V_{DSS}	I_{C25}	$V_{CE(sat)}$
1200 V	30 A	3.2 V
1200 V	30 A	3.8 V

Preliminary data

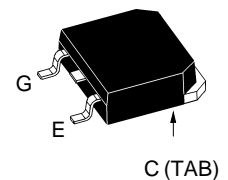


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	1200	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1\text{ M}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	30	A
I_{C90}	$T_C = 90^\circ\text{C}$	15	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	60	A
SSOA (RBSOA)	$V_{GE} = 15\text{ V}$, $T_J = 125^\circ\text{C}$, $R_G = 10\ \Omega$ Clamped inductive load	$I_{CM} = 40$ @ $0.8 V_{CES}$	A
P_C	$T_C = 25^\circ\text{C}$	150	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
Maximum tab temperature soldering SMD devices for 10s		260	$^\circ\text{C}$
Weight	TO-247AD/TO-268	6/4	g

TO-247AD
(IXGH)



TO-268
(IXGT)



G = Gate
E = Emitter

C = Collector
TAB = Collector

Features

- International standard packages: JEDEC TO-247AD & TO-268
- IGBT and anti-parallel FRED in one package
- MOS Gate turn-on
 - drive simplicity
- Fast Recovery Exptaxial Diode (FRED)
 - soft recovery with low I_{RM}

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

Advantages

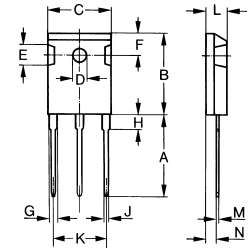
- Saves space (two devices in one package)
- Easy to mount with 1 screw (isolated mounting screw hole)
- Reduces assembly time and cost

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 1\text{ A}$, $V_{GE} = 0\text{ V}$	1000		V
$V_{GE(th)}$	$I_C = 250\ \mu\text{A}$, $V_{CE} = V_{GE}$	2.5		V
I_{CES}	$V_{CE} = V_{CES}$ $V_{GE} = 0\text{ V}$		2	500 μA
I_{GES}	$V_{CE} = 0\text{ V}$, $V_{GE} = \pm 20\text{ V}$			$\pm 100\text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$ Note 2			3.2 V 3.8 V

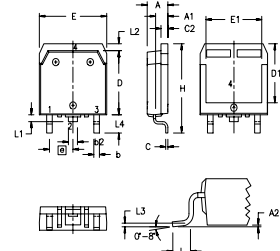
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C90}; V_{CE} = 10\text{ V}$, Note 2.	12	15	S
C_{ies}			1700	pF
C_{oes}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		155	pF
C_{res}			38	pF
Q_g			69	nC
Q_{ge}	$I_C = I_{C90}; V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		13	nC
Q_{gc}			26	nC
$t_{d(on)}$			25	ns
t_{ri}	Inductive load, $T_J = 25^\circ\text{C}$		15	ns
$t_{d(off)}$	$I_C = I_{C90}; V_{GE} = 15\text{ V}$		150	ns
t_{fi}	$V_{CE} = 0.8 V_{CES}; R_G = R_{off} = 10\ \Omega$ Note 1.	15N120BD1 15N120CD1 15N120BD1 15N120CD1	160 115 1.75 1.05	320 190 3.0 1.6
E_{off}				mJ
$t_{d(on)}$			25	ns
t_{ri}	Inductive load, $T_J = 125^\circ\text{C}$		18	ns
E_{on}	$I_C = I_{C90}; V_{GE} = 15\text{ V}$		1.5	mJ
$t_{d(off)}$	$V_{CE} = 0.8 V_{CES}; R_G = R_{off} = 10\ \Omega$		270	ns
t_{fi}	Note 1	15N120BD1 15N120CD1 15N120BD1 15N120CD1	360 250 3.5 2.1	ns mJ mJ mJ
R_{thJC}				0.83 K/W
R_{thCK}	TO-247		0.25	K/W

Reverse Diode (FRED)		Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
V_F	$I_F = 20\text{ A}$, $V_{GE} = 0\text{ V}$ $I_F = 20\text{ A}$, $V_{GE} = 0\text{ V}$, $T_J = 125^\circ\text{C}$	2.6 2.1		2.8 V V
I_F	$T_C = 25^\circ\text{C}$ $T_C = 90^\circ\text{C}$			33 V 20 V
I_{RM}	$I_F = 20\text{ A}$; $-di_F/dt = 400\text{ A}/\mu\text{s}$, $V_R = 600\text{ V}$		15	A
t_{rr}	$V_{GE} = 0\text{ V}$; $T_J = 125^\circ\text{C}$		200	ns
t_{rr}	$I_F = 1\text{ A}$; $-di_F/dt = 100\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$, $V_{GE} = 0\text{ V}$		40	ns
R_{thJC}				1.6 K/W

- Notes: 1. Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G .
2. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$

TO-247 AD (IXGH) Outline


Dim.	Millimeter Min. Max.	Inches Min. Max.
A	19.81 20.32	0.780 0.800
B	20.80 21.46	0.819 0.845
C	15.75 16.26	0.610 0.640
D	3.55 3.65	0.140 0.144
E	4.32 5.49	0.170 0.216
F	5.4 6.2	0.212 0.244
G	1.65 2.13	0.065 0.084
H	- 4.5	- 0.177
J	1.0 1.4	0.040 0.055
K	10.8 11.0	0.426 0.433
L	4.7 5.3	0.185 0.209
M	0.4 0.8	0.016 0.031
N	1.5 2.49	0.087 0.102

TO-268AA (D³ PAK)


Dim.	Millimeter Min. Max.	Inches Min. Max.
A	4.9 5.1	.193 .201
A ₁	2.7 2.9	.106 .114
A ₂	.02 .25	.001 .010
b	1.15 1.45	.045 .057
b ₂	1.9 2.1	.75 .83
C	.4 .65	.016 .026
D	13.80 14.00	.543 .551
E	15.85 16.05	.624 .632
E ₁	13.3 13.6	.524 .535
e	5.45 BSC	.215 BSC
H	18.70 19.10	.736 .752
L	2.40 2.70	.094 .106
L ₁	1.20 1.40	.047 .055
L ₂	1.00 1.15	.039 .045
L ₃	0.25 BSC	.010 BSC
L ₄	3.80 4.10	.150 .161

Min.
Recommended
Footprint

